



## IMAGING AND DIAGNOSTIC TESTING

### DETERMINANTS OF LEFT ATRIAL VOLUME IN HEALTHY INDIVIDUALS AND ATHLETES

ACC Poster Contributions

Georgia World Congress Center, Hall B5

Tuesday, March 16, 2010, 9:30 a.m.-10:30 a.m.

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Session Title: General Echocardiography: Atrial Function Assessment

Abstract Category: General Echocardiography: TTE

Presentation Number: 1253-195

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**Background:** Among multiple determinants of left atrial volume index (LAVi) the role of ageing is still debated while that of competitive sport is poorly investigated. We aimed at assessing the determinants of LAVi in a study cohort of healthy individuals and competitive athletes

**Methods:** 415 healthy individuals [mean age  $37 \pm 17$  years, systolic blood pressure (SBP)  $123 \pm 14$  mmHg, diastolic blood pressure (DBP)  $75 \pm 9$  mmHg; 66% males; body mass index (BMI)  $23 \pm 3$  Kg/m<sup>2</sup>; 42% athletes] underwent comprehensive Doppler echocardiography including assessment of LAVi by biplane area-length, of LV stroke volume index (LVSVi) and of left ventricular (LV) relaxation by peak early diastolic velocity averaged from septal and lateral corner of the mitral annulus (Em) and filling pressure by the ratio of early diastolic peak LV inflow velocity to Em ratio (E/Em), respectively.

**Results:** Mean LAVi was  $31 \pm 8.5$  ml/m<sup>2</sup> (range = 31-64 ml/m<sup>2</sup>) in the pooled population,  $37 \pm 9$  ml/m<sup>2</sup> (95% CI 35.2-37.9 ml/m<sup>2</sup>) in athletes, and  $27 \pm 6$  ml/m<sup>2</sup> (95% CI 26.5-27.9 ml/m<sup>2</sup>) in non-athletes ( $p < 0.0001$ ). By multiple linear regression analyses, competitive sport (standardized beta coefficient = 0.26,  $p < 0.0001$ ), age (beta=0.14,  $p < 0.005$ ), BMI (beta=0.10,  $p < 0.0$ ), LV mass index (LVMI) (beta=0.24,  $p < 0.0001$ ), LVSVi (beta=0.35,  $p < 0.0001$ ) and E/Em ratio (beta=0.073;  $p < 0.05$ ), were independent predictors of LAVi (cumulative R<sup>2</sup> = 0.55, SE = 5.7 ml/m<sup>2</sup>,  $p < 0.0001$ ) in the pooled population. In athletes age (beta = 0.22,  $p < 0.01$ ), LVMI (beta=0.20,  $p < 0.01$ ), LVSVi (beta=0.43,  $p < 0.0001$ ) (cumulative R<sup>2</sup>=0.41,  $p < 0.001$ ), and in non-athletes BMI (beta=0.19,  $p < 0.01$ ), LVMI (beta=0.28,  $p < 0.0001$ ), LVSVi (beta=0.20,  $p < 0.001$ ) and E/Em (beta=0.12,  $p < 0.05$ ) (cumulative R<sup>2</sup>=0.30,  $p < 0.001$ ) were independently associated with LAVi.

**Conclusions:** In healthy individuals competitive sport, age, BMI, LVMI and LVSVi influences LAVi independent of LV diastolic function. Age is an independent predictor of LAVi only in athletes. These findings demonstrate that determinants of LAVi vary significantly depending on the athletic status of the investigated subjects, and thus may have potential impact when assessing normalcy of LAVi in clinical echocardiography.